
NEUTRONS FOR SCIENCE AND INDUSTRY — UPPSALA NEUTRON BEAM ACTIVITIES

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A wide programme on neutron-induced data for various applications is running at the 20–180 MeV neutron beam facility at the The Svedberg Laboratory, Uppsala. The main research areas are nuclear data for accelerator-driven transmutation of nuclear waste, single-event effects, and dose effects in fast neutron cancer therapy and aviation environments. In addition, experiments motivated by fundamental nuclear physics are undertaken. Moreover, commercial device testing motivated by single-event effects is a growing activity.

Two major experiment devices are frequently used; SCANDAL (SCAttered Nucleon Detection AssembLy), primarily intended for neutron elastic scattering, but also useful for (n,pX), (n,dX) and (n,n'X) reaction studies, and MEDLEY, aiming at studies of charged-particle production, ranging from protons to alpha particles.

The rapid growth in demand for neutrons has motivated the construction of a new neutron beam facility at TSL. The most important features of the new facility are:

- Increased intensity by reduction of the distance from neutron production to experiments.
- Availability of much larger beam diameters.
- Increased versatility concerning various beam parameters, like the shape.
- Reserved space for a future pulse sweeping system.

For nuclear data research, the increased intensity will facilitate a large experimental program at 180 MeV, hitherto excluded by count rate limitations.

For testing of electronics, the increased intensity in combination with a larger beam diameter, which facilitates testing of a large number of components simultaneously, will provide a total failure rate of about a factor 300 larger than for the present facility. This means that the new TSL neutron beam facility can outperform any existing facility in the world.